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ANALYSIS OF THE LIFE CYCLE OF EQUIPMENT OPERATING UNDER EXCESSIVE PRESSURE AT AN OIL REFINERY

Every year around 20,000 major accidents occur in the oil and gas industry in the world, and in recent years there has been an increase in the accident rate in the oil refining industry[1]. The station of accidents at works continues to be a complex socio-economic problem[2]. Oil refineries are among the most fire and explosive objects, emergency depressurization of process equipment can cause a major accident with attendant emissions of toxic substances, destruction and damage of expensive equipment, process stops, fires and explosions [3, 4].

Using retrospective methods of analysis, for the period since 2008 till 2018 has been studied specifics of repairs, defectoscopy and ways to improve reliability and maintenance-free operating time for column, reactor and heat exchange types of equipment which used at the Belarusian refinery.

According to the data for 2018, more than 3,700 units of equipment operating under excessive pressure have been installed in the territory of the studied enterprise. And more than 3,200 units are in operation. They can be classified by type in the following way: heat exchange equipment (37%); equipment of capacitive type (41%); filters (7%); column type equipment (6%); separators (6%); reactor type equipment (2%).The most common reason for the repair of equipment is the replacement of unions with conditional passage up to DN100, replacement of internal devices, replacement of unions with conditional passage of DN100 or more. Less often performed repair of the base metal and metal of the body welds.

To minimize the number of repairs of base metal and weld metal, it is necessary to strengthen the input control for newly installed equipment, strengthen control over the selection of material for a specific working environment and operating parameters such as temperature and pressure, ensure strict adherence to process regulations, and apply for newly designed equipment modern technical solutions to minimize the number of stagnant zones.

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